CASE REPORT

Comamonas testosteroni: A Rare Case of Bacteremia in a Patient with Chronic Liver Disease

Shubham Kumar[1], Omender Singh[2], Pankaj Soni[3], Deven Juneja[4], Hari K Yadav[5], Omaim JSA Saleh[6]

Received on: 30 December 2022; *Accepted on:* 14 March 2023; *Published on:* 06 May 2023

Abstract

Background: Despite recent advancements, patients with sepsis and septic shock continue to have high morbidity and mortality. Appropriate empiric antimicrobials form the cornerstone of therapeutic interventions and are vital for improving patient outcomes. Rare infections may sometimes complicate clinical diagnosis and make a choice of empiric antimicrobials challenging. Hence, recognition of rare infections and their antimicrobial susceptibility pattern is imperative for the management of such cases.

Case description: *Comamonas* spp. are common environmental nonfermentative gram-negative bacilli that occasionally cause human disease. Human infections are not usually life-threatening. We present a case of bacteremia secondary to *Comamonas testosteroni* (*C. testosteroni*) in a 35 years old patient with chronic liver disease (CLD).

Conclusion: *Comamonas testosteroni* (*C. testosteroni*) is an emerging human pathogen and may rarely cause sepsis and septic shock, especially in immunocompromised patients. The sensitivity pattern and choice of antibiotics need to be further evaluated for this rare infection, as early appropriate therapy may affect outcomes.

Keywords: Bacteraemia, *Comamonas testosteroni*, Sepsis.

Indian Journal of Critical Care Case Report (2023): 10.5005/jp-journals-11006-0049

Case Description

A 35-year-old morbidly obese male, who was a known case of nonalcoholic steatohepatitis-related chronic liver disease (CLD), presented to triage with complaints of irrelevant talking, pain in the abdomen and shortness of breath, and decreased output of 2–3 days duration. Abdominal pain was diffuse in location, severe in intensity, aggravated after food, radiating to the chest, along with nausea and vomiting episodes. He also had a history of episodes of constipation and black stools.

On physical examination, he was afebrile and drowsy, had a heart rate of 120/minute, blood pressure of 142/60 mm Hg, and respiratory rate of 20/minute. Oxygen saturation was 90% on room air. His admission Acute Physiology and Chronic Health Evaluation II score was 12, with a predicted death rate of 15%. Initial arterial blood gases revealed a pH—7.3, pO_2—74, pCO_2—25, and HCO_3—17 with lactate—5.0 mmol/L, on room air. He was shifted to the intensive care unit (ICU) in view of his altered mental status for neurological monitoring.

Paired blood cultures were sent, and an injection of cefepime 2 gm 12 hourly was started as the initial empiric therapy. Laboratory reports showed hemoglobin—8.0 g/dL and total leukocyte count—4600 cells/mm^3, raised bilirubin (conjugated—4.94 mg/dL and unconjugated—7.16 mg/dL), international normalized ratio—2.51 and ammonia—198 µg/dL. Renal function tests were within normal range. The urine routine showed no pus cells. On day 3, his initial paired blood culture report came positive for *C. testosteroni* and injection cefepime was continued based on the sensitivity pattern (Table 1) and clinical response. The culture was performed using the BacT ALERT system, BioMerieux, and identification was performed using matrix assisted laser desorption ionization-time of flight mass spectrometry analysis and sensitivity using the VITEK 2 system.

[1,2,4,6]Department of Critical Care Medicine, Max Super Speciality Hospital, Delhi, India

[3,5]Department of Internal Medicine, Max Super Speciality Hospital, Delhi, India

Corresponding Author: Shubham Kumar, Department of Critical Care Medicine, Max Super Speciality Hospital, Delhi, India, Phone: +91 9582434576, e-mail: power.mallik@gmail.com

How to cite this article: Kumar S, Singh O, Soni P, *et al. Comamonas testosteroni*: A Rare Case of Bacteremia in a Patient with Chronic Liver Disease. Indian J Crit Care Case Rep 2023;2(2):44–45.

Source of support: Nil

Conflict of interest: None

Patient consent statement: The author(s) have obtained written informed consent from the patient for publication of the case report details and related images.

Over the next few days, he showed gradual improvement in consciousness. Hemoglobin also remained stable, and there was no evidence of any gastrointestinal bleeding. Repeat paired blood culture performed on day 5 was sterile, and he was shifted out of ICU on day 6.

Discussion

Comamonas testosteroni (*C. testosteroni*), is a gram-negative, aerobic, motile, nonfermentative, and nonspore forming bacillus.[1] *C. testosteroni* is an environmental microbe generally present in nature (water, soil, and animals) and in waste products. Due to its inherent ability as an environmental pathogen requiring minimal nutrient support to grow and its ability to adapt to different physical conditions, it may cause opportunistic nosocomial

Table 1: Sensitivity pattern for *C. testosteroni*

Sensitive	*Resistant*
Amikacin	Ciprofloxacin
Aztreonam	Levofloxacin
Cefepime	Polymyxin B
Cefepime/tazobactam	Trimethoprim/sulfamethoxazole
Cefoperazone/sulbactam	
Ceftazidime	
Meropenem	
Piperacillin/tazobactam	
Ticarcillin/clavulanate	

infections. In the ICU setting, it may be an important cause of mild yet persistent infections, particularly among patients with underlying comorbidities or predisposing conditions. It has been reported to cause several infections, with intra-abdominal infection being the commonest, followed by skin and soft tissue infections and ear cholesteatoma.[2–4] Rarely, it may be associated with more severe infections like endocarditis, pneumonia, peritonitis, and meningitis.[2–4] Most of the cases reported are community-acquired, with most patients having a predisposition to immunosuppression.[4] Out of the four species of *Comamonas* spp, *C. testosteroni* bacteremia has not been reported recently. Bacterial translocation from the gastrointestinal tract may have a vital part in these infections.[5,6] However, the majority of patients have been shown to have favorable outcomes, if appropriate antimicrobials are administered.

Patients with sepsis and septic shock continue to have high morbidity and mortality. Appropriate empiric antimicrobials form the cornerstone of therapeutic interventions and are vital for improving patient outcomes.[7] Rare infections may sometimes complicate clinical diagnosis and make a choice of empiric antimicrobials challenging. Hence, recognition of rare infections and their antimicrobial susceptibility pattern is imperative for the management of such cases.

The present case has several salient features. We have presented a case of bacteremia with a rare organism in a rare setting. Most of the previous reports are from Western countries, and *Comamonas* infections have been rarely reported from the Indian subcontinent.[8]

The mechanisms involved in human pathogenicity are still not clearly understood. *C. testosteroni* was so named because of its ability to utilize carbon atoms during testosterone metabolism. A few strains of *C. testosteroni* possess the ability of plasmid-mediated bla New Delhi metallo-beta lactamase resistance, which provides multidrug resistance, hence possibly limiting therapeutic choices in human infections.[9] Thus, automated identification systems may be helpful in isolating such organisms. Additionally, the rapid spread of environmental antimicrobial resistance is a cause of concern for clinicians, limiting treatment options. Most infections caused by *C. testosteroni* are mild and generally intra-abdominal infections, so the associated mortality is low. *Comamonas* isolates are generally susceptible to most of the antibiotic classes such as β-lactams, β-lactamase inhibitors, cotrimoxazole, aminoglycosides, and fluoroquinolones.[2]

In our case, early recognition of bacteremia, aggressive resuscitative measures and early appropriate empirical antimicrobials may have rescued our patient and prevented the development of multiorgan dysfunction and worse clinical outcome.

To conclude, *C. testosteroni* is an emerging human pathogen and may rarely cause sepsis and septic shock, especially in immunocompromised patients. The sensitivity pattern and choice of antibiotic need to be further evaluated for this rare infection, as early appropriate therapy may affect outcomes.

Orcid

Shubham Kumar https://orcid.org/0000-0002-6870-2506
Omender Singh https://orcid.org/0000-0002-3847-4645
Pankaj Soni https://orcid.org/0000-0003-1544-335X
Deven Juneja https://orcid.org/0000-0002-8841-5678
Hari K Yadav https://orcid.org/0000-0002-2714-8350
Omaim JSA Saleh https://orcid.org/0000-0003-1441-6464

References

1. Duran A, Abacilar AF, Uyar IS, et al. Comamonas testosteroni endocarditis in Turkey: a case report and review of the literature. Int Med J Sifa University 2015;2(2):44–47. DOI: 10.4103/2148-7731.152117
2. Tsui TL, Tsao SM, Liu KS, et al. Comamonas testosteroni infection in Taiwan: reported two cases and literature review. J Microbiol Immunol Infect 2011;44(1):67–71. DOI: 10.1016/j.jmii.2011.01.013
3. Barbaro DJ, Mackowiak PA, Barth SS, et al. Pseudomonas testosteroni infections: eighteen recent cases and a review of the literature. Rev of Infect Dis 1987;9(1):124–129. DOI: 10.1093/clinids/9.1.124
4. Cooper GR, Staples ED, Iczkowski KA, et al. Comamonas (Pseudomonas) testosteroni endocarditis. Cardiovasc Pathol 2005;14(3):145–149. DOI: 10.1016/j.carpath.2005.01.008
5. Gul M, Ciragil P, Bulbuloglu E, et al. Comamonas testosteroni bacteremia in a patient withperforated acute appendicitis. Acta Microbiol Immunol Hung 2007;54(3):317–321. DOI: 10.1556/AMicr.54.2007.3.6
6. Hagiya H, Murase T, Sugiyama J, et al. Delftia acidovorans bacteremia caused by bacterial translocation after organophosphorus poisoning in an immunocompetent adult patient. J Infect Chemother 2013;19(2):338–341. DOI: 10.1007/s10156-012-0472-x
7. Evans L, Rhodes A, Alhazzani W, et al. Surviving sepsis campaign: international guidelines for the management of sepsis and septic shock 2021. Crit Care Med 2021;49(11):e1063–e1143. DOI: 10.1097/CCM.0000000000005337
8. Farooq S, Farooq R, Nahvi N. Comamonas testosteroni: is it still a rare human pathogen? Case Rep Gastroenterol 2017;11(1):42–47. DOI: 10.1159/000452197
9. Wang X, Liu W, Zou D, et al. High rate of New Delhi Metallo-β-Lactamase 1-producing bacterial infection in China. Clin Infect Dis 2013;56(1):161–162. DOI: 10.1093/cid/cis782